EPA Region 7 TMDL Review

TMDL ID:	MO7187	**Waterbody ID:**	MO_7187
Waterbody Name:	SPRING FORK LAKE		
Tributary:	CHEESE CREEK		
Pollutant:	NUTRIENTS		
State:	MO	**HUC:**	10300103
BASIN:	LAMINE		
Submittal Date:	7/5/2006		
Approved:	Yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

A letter dated June 30, 2006 and received by EPA July 5, 2006 formally submitted this TMDL for approval.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Phosphorus and algae are shown to be correlated; therefore, phosphorus is the targeted nutrient in this TMDL. The loading capacity (LC) for Lamar Lake is given as 836 pounds per year. The LC is determined by multiplying the target total phosphorus (TP) concentration (36 ug/L) by the annual volume of water inflow and a conversion factor used to express the resultant load as pounds per year. The targeted LC will result in a 80% reduction of TP load to the lake. The given LC is likely to result in the attainment of water quality standards (WQS).

As previously noted during this TMDLs public notice period, we feel the calculations in appendix E. show an inconsistency in the use of estimated physical measurements. We feel that if a runoff is obtained from a valid source (in this case the Missouri Water Atlas) there is no need or validity in performing a calculation using that number to obtain another estimate of that same number. If this recalculation was performed using the same lake volume used in the calculation of residence time (step 2) the estimates of annual flow would be the same. The fact that they are not shows an inconsistency in the estimates used for the lake volume. If the original estimate of annual lake inflow is used throughout the TMDL calculation, the TMDL would be 516 pounds per year instead of the stated 836 pounds per year. With these caveats stated, using the TMDL of 836 pounds per year and the volume and residence times from step 2 numerous lake models used to estimate growing season total phosphorus (TP) calculate that total phosphorus concentration to range from 17 to 41 ug/L. Given that the target TP for this TMDL is 36 ug/L and that follow-up monitoring is specified in this TMDL we don't believe this issue will prevent our approval of this TMDL in its present form with our noted exceptions.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Beneficial uses for Spring Fork Lake are livestock and wildlife watering, protection of warm water aquatic life, protection of human health, secondary contact recreation and drinking water supply. The use that is impaired is drinking water supply. The WQS that is being exceeded is a general criterion (Missouri WQSs, 10 CSR 20-7.031(3)(A) and (C)) and a taste- and odor-producing substance criterion (Missouri WQS, 10 CSR 20-7.031(4)(F). These criteria are narrative. A numeric target of 36 ug/L of total phosphorus (TP) was developed to address the narrative; it was determined by use of a reference lake approach.

Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

Nutrients are directly targeted as the pollutant responsible for the response parameter of algal biomass. Blue-green algae make up a larger proportion of the algal biomass as nutrient concentrations are elevated. These blue-green algae release compounds into the water which cause taste and odor problems in drinking water supplies. The targeted TP is linked to algal biomass as measured by chlorophyll a (Chla). The significant regression between TP and Chla gives a corresponding Chla value for the TP target of 36 ug/L (16 ug Chla/L). Achieving the target TP concentration will result in the lake concentrations of Chla being at a natural level.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

No point sources or confined animal feeding operations (CAFOs) are located in the watershed. All loading is from non-point sources. Distribution of this loading is given in tabular form according to land use and loading coefficient for each land use. It seems all sources have been considered.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

All identified loading is non-point. WLA is stated as zero and an explict margin of saftey is given.

WLA Comment

There are no point sources or CAFOs in the watershed. The waste load allocation is set at zero (0).

LA Comment

Load allocation is set at 752 pounds per year.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

An explicit margin of safety is set at 10% of the load capacity, 84 pounds per year.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Target TP concentrations were derived using data from the growing season when taste and odor problems are most likely to occur. The target of 36 ug/L is recommended for all seasons to address any resuspension of TP which may occur outside the growing season.
Achieving this target should result in Chla concentrations of 16 ug/L (this section of the TMDL contains an apparent error listing the targets as 40 and 19 ug/L for TP and Chla respectively).

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

A presentation was made to a farmer-producer group in October 2004 on TMDLs and their implementation. The Sedalia Source Water Protection Committee has been involved with the MDNR in holding public meetings and developing a watershed plan. The TMDL was on public notice from May 12 to June 11, 2006 and distributed to the Missouri Clean Water Commission, the Water Quality Coordinating Committee, Parsons Corporation, stream team members and legislators representing the two counties in which Spring Fork Lake"s watershed extends.

Public comments and responses are part of this administrative record.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Specific monitoring is outlined for volunteer and MDNR staff. The Sedalia Water Department samples eight times a year under the Lakes of Missouri Volunteer Program (LMVP) and MDNR staff will schedule post implementation sampling. Additionally, 20 volunteers have completed training and are monitoring Cheese Creek and Spring Fork Creek.

Reasonable assurance

Reasonable assurance only applies when reductions in nonpoint source loading is required to meet the prescribed waste load allocations.

As there are no point sources in the watershed reasonable assurances are not required.